

PARNASSIUS OF THE WORLD.*

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Parnassians form that group of Lepidoptera which are chosen by collectors more than any other kind, because they are interesting. They are mountain flyers only and appear at 4000 feet and from there upwards; and one species, *P. charltonius*, from Asia, has been caught as high as 20,000 feet. They are also pretty butterflies with their very thin almost transparent wings with black and red spots and dots. A great peculiarity of this group is that you can hardly find two specimens of the same species which are exactly alike. The same species found in different localities will show a different number of spots and dots and for that reason we have an enormous number of variations, all listed with different names. Years ago it was a standing joke that a Parnassius was the best seller for any dealer in Lepidoptera because for every specimen found with an extra dot or spot, he could get an extra dollar; and I believe that there was more truth than fiction in this statement.

It is not more than fifteen years ago that Professor Dr. Seitz and Otto Bang-Haas, owner of the firm of Dr. Staudinger and Bang-Haas in Dresden, Germany, set to work to bring some light and order into the group of Parnassians with the result that today there are listed in the palaeartic regions 27 valid species with 255 sub-species or local variations and about 177 aberrations. Here in North America we have 4 species with 7 variations, three of which are also found in the palaeartic zone. They are *P. eversmanni*, *clodius* and *nomion*. Of these 27 species I have here 16 with 76 subspecies and 7 aberrations which I want to bring to your closer attention.

The Parnassians belong the family of Papilionidae, because of the fact that the internal vein of the hind wings is missing, which is characteristic of all papilionine genera. The name *Parnassius* was derived from Mt. Parnassus in Greece which was sacred to the god Apollo and the first butterfly of this group was described by Linné in 1758 under the name of *Parnassius apollo*. When I come to the species "*apollo*" I will add a few more words regarding this type of Linné which is still in existence.

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The Parnassians, we observe, are butterflies of medium size, with more or less diaphanous wings, generally white or yellow in color, marked with black spots and round pink and yellow spots, margined with black. The head is relatively small, thickly clothed with hair. The caterpillars have very small heads. They are flattened, having a somewhat leech-like appearance; are black or dark brown in color; marked with numerous light spots. They mainly feed on *Sedum* or stonecrop, *Saxifraga* or saxifrage, *Sempervivum* or houseleek, and *Corydalis*. The chrysalis is short and rounded at the head. Pupation takes place on the surface of the ground among leaves and litter, a few loose threads of silk being spun at the place where transformation occurs.

As said before, the Parnassians are mountain flyers and we find them, with the exception of Great Britain, in all the low and high mountain regions of Europe and Asia, mainly in Siberia, also here in North America.

The authors of older works on Lepidoptera all start the genus *Parnassius* with species "Apollo," because the first *Parnassius* to our knowledge was an "apollo." In the last ten years, however, they have been re-arranged and in the same way as our true Papilios have been put into 46 distinct groups, but Otto Bang-Haas has arranged the Parnassians into seven groups beginning with the *mnemosyne* group to which belong 2 species *mnemosyne* and *stubbendorffi*. I have here seven representatives of *mnemosyne* and three of *stubbendorffi*. While the former flies in Europe and Asia, the latter comes from Asia.

We find the typical *mnemosyne* in the Hartz Mountains in middle Germany and its local variation, *ariovistus*, in Würtemberg; and *hartmanni* in Bavaria. A dark aberration of the latter, var. *melaina*, is found in Austria. In Sicily we find *nebradensis*; *pyrenaica* in France; *craspedontis* in Ukraine and Russia; and *gigantea* in China. Now this is all the same *mnemosyne*, flying in different localities; and yet there are not two among them which are exactly alike. This holds good of all the local variations or subspecies of the seven groups of *Parnassius*.

The typical *stubbendorffi* come from the Altai mountains, in Siberia, the var. *citrinarius* from Japan and *nankingi* from China. The next is the *clarius* group with 4 species: *clarius*, *eversmanni*, *clodius*, and *nordmanni*. *Clarius* and *nordmanni* are not represented in my collection. Of *clarius* we have only the typical form

and 2 aberrations. It is found in the Altai Mountains, Siberia and flies at 5000 feet. *Nordmanni* and its var. *minima* represent the smallest *Parnassius* we have; and it is found in the Caucasus Mountains in Russia, flying at 14,000 feet. *Eversmanni*, a very pretty *Parnassius* and also quite rare, is found in Central Siberia, and in North America, in Alaska. *Clodius* is found in the mountains of California, Oregon and Washington.

Now we come to the third, the Apollo group, with 10 species, the first of which is *delius* and the typical form is found in the Tyrolean Alps; its var. *expectatus* comes from Switzerland and *fortuna* from Siberia. The latter has a female form and ab. *nigricans*. *Bremeri* flying in the Province of Amur, Siberia, was formerly listed as a subspecies of *delius*, but is now considered a distinct species. It is not represented here. The next one is *apollo*, which has by far the largest number of subspecies and aberrations, in fact, so many that it was found necessary to subdivide the apolloes again into 12 distinct races by localities. Before we go into these 12 local subdivisions, I would like to say a few more words about the first *apollo*. This was a large sized female, caught in Upland, Sweden, Scandinavia, and came into possession of Linné between the years 1728 and 1734. It was mentioned by him for the first time in 1736 and again in 1741, but it was not described by him under the name of *Parnassius apollo* until 1758. This type of all the Parnassians is still in existence in the collection of the Linnean Society at the Burlington House in London. I have a very good reproduction of this Parnassius. Today, 200 years later, we find the same species in Upland listed under the Scandinavian race as *Parnassius apollo linnaei* or *apollo verus*—the true *apollo*. Now we come to the 12 *apollo* races by localities:

1. Germany, represented by the typical *apollo* and 4 subspecies: *bartholomaeus*, *bajuvaricus*, *thiemo* and *vinningensis*.
2. Austria, with North Tyrol represented by *cetius* and *wenzeli*.
3. Moravia and the Carpathian Mts.: by *carpathicus*.
4. Balkan States: by *omotimoius*.
5. Switzerland: by *nivatus*, *rhaeticus* and *valesiacus*.
- 6a. Italy and South Tyrol: by *rubidus*.
- 6b. Italy and Central Mediterranean: by *siciliae*.
7. France: by *provincialis*.
8. Spain: not represented.

9. Scandinavia-Russia: by *linnaei*, *scandinavica* and *uralicus*.
 10. Caucasus-Asia Minor—Not represented.
 11. Russian Asia—by *merzbacheri*.

And in addition a German aberration—*excelsior*.

These twenty are all *apollos*, from different localities, but no two are alike.

The next species is *honrathi*, also an Asiatic Parnassius, but not represented in my collection.

Then we have *apollonius* with 3 variations represented. The typical species flies in Switzerland, an ab. *flavomaculata* is found in Turkestan, West Asia, and both *narynus* and *gloriosus* come from Naryn in Siberia. *Nomion* is the next species. The typical form comes from the Altai Mountains in Siberia, while the American *nomion* is found in Alaska and also in California. The var. *nominulus* flies in Siberia and so does *titan*.

The next species is *discobolus*. The typical form from Siberia, the var. *griseldis* and *romanovi* from Turkestan, West Asia and *insignis* from Siberia. *Actius* is the next species. The typical form is found in Naryn, Siberia, and so is the var. *caesar*, while *minuta* comes from West Asia and flies at 10,000 feet.

Now we come to the species *jacquemonti*. The typical form from Kashmir, East India, and its var. *mercurius* from China, as also the var. *actinoboloides* flying at 12,000 feet.

The last species of the apollo group is *epaphus*. The typical form not represented, is found in Thibet, Asia, and its var. *cachemiriensis* comes from the northwestern part of the Himalaya Mountains and so does the var. *hillensis*, while *phariensis* comes from the central part of the Himalaya Mountains and while I do not have the varieties I will mention that two of them are found on Mt. Everest, *himalayanus* flying at 14 to 17,000 feet, and *everestis* flying on the Rongbuk Glacier, at 18,500 feet.

The next or fourth group is the *acco* group with 3 species—*acco*, *simo* and *tenediis*. *Acco* is from Thibet, and the rare form of *simo*, also from Thibet at 16,000 feet, are not in my collection. Its var. *simonius* comes from Turkestan, West Asia, flies at 12 to 15,000 feet and is very wild and hard to catch. Var. *kozloffi* comes from Amdo, E. India and var. *boedromius* from Siberia.

Simo has one peculiarity. It is the only species with the wide open copulatory pouch missing. While in all other species the female is easily distinguished from the male by this pouch, in

simo, it is hard to know the difference between the sexes. However, the body of the male is tubular, bent downwards, while the female body is barrel shaped.

The typical form of the species *tenedi* comes from the Altai Mountains in Siberia and flies at 5 to 7000 feet.

The fifth group is *Tadumia*. Moore gave this name to the species belonging to this group, instead of *Parnassius*, including four species, *delphi*, *stoliczkanus*, *acdestis* and *imperator*. *Stoliczkanus* was formerly listed as subspecies of *delphi*. It was found to be a true species, however; it flies in Ladak, Siberia, at 18,000 feet. It is not represented here; neither is *acdestis*, which comes from Amdo, East India. Of the species *delphi* I have represented quite a number of subspecies and aberrations.

The typical form is found in Turkestan, West Asia, and its var. *intermedia* in Siberia, also the var. *albulus*. *Delphi* has a great many aberrations. We have four of them here, *boettcheri*, and *diaphana* from Naryn, Siberia, and the almost black ab. *styx* from Turkestan, West Asia and *satanas* from Siberia. Other subspecies of *delphi* are *infernalis* and *illustris*, both from Fergana, West Asia, *cardinalis* from Manchuria, East Asia, and *manaievi* from Ladak, Siberia. The last species of this group is *imperator*, one of the rarest of the Parnassians. The typical form comes from Thibet, and contrary to the rule that in Lepidoptera the female is always the hardest to get, in this case it is the male that is by far the rarest. It is estimated that the ratio is 1 male to 250 females caught. This is probably due to the fact that the male is very wild and restless while the females are lazy and therefore easier to catch. Its subspecies *regulus* flies in China, at 10,000 feet.

The sixth group is the *Hardwickii* group with 3 species: *hardwickii*, *szechenyi* and *orleansi*. The typical form *hardwickii* comes from Simla, East India. Besides the latter I have here a subspecies which as yet has not been named. It was caught near Gartok, East India, which is in the western part of the Himalaya Mountains flying at 15,000 feet. *Hardwickii* is the only Parnassius species, as far as it is known today, which has at least two and probably more generations. The spring generation differs from the fall generation.

The next species is *szechenyi*, and the typical form flies in China, 10,500 feet and so does its subspecies *frivaldskyi*. Of the third species *orleansi*, the typical form is not represented, only its

subspecies *bourboni*, which comes from China and flies at 10 to 12,000 feet.

The seventh or last group is called *Kailasius*, which has only one species *charltonius* and Moore used the name *Kailasius* instead of *Parnassius*. *Charltonius* is a very pretty *Parnassius* from China, together with *acco* and *simo* at an altitude of 15 to 20,000 feet. The typical form is not represented; its var. *bryki* comes from Thibet, at 16,000 feet and aberration *deckerti* from Kashmir, East India, at 12 to 15,000 feet.

This ends the palaeartic *Parnassius*.

It will be noticed that five or six subspecies in this collection are marked co-type. This means that these specimens have also been taken into consideration in the description of a new type. There is only one more species of *Parnassius* which needs to be mentioned and that is our *smintheus* and its var. *nanus* found at high elevations in the mountains from Colorado to California and from New Mexico to Montana. I have a good many examples here and I dare say that if they were flying in Europe, each pair would have one additional name as a subspecies or an aberration.

I trust that my rather limited selection and discussion of specimens will have served its purpose—to give a general idea of the “*Parnassius* of the World.”

***Vespula maculata* and *Apis mellifica*.**—Robbinsville, N. C., October 4, 1929. To-day I saw a female *Vespula maculata* Linn. pounce upon a worker *Apis mellifica* Linn. After stinging it several times between the segments and biting it severely the hornet carried it away to devour at leisure.—S. B. DENTON, Robbinsville, N. C.